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(54) Hinge mechanism for folding legs, brackets and the like

(57) A hinge mechanism for a leg or other support to be folded is described. As shown, a bracket 5 for securing to the underside of a table top has a substantially U-shaped portion embracing the upper end 2 of a leg 1 to be folded. Pivot means 7 pass through the substantially U-shaped portion and the upper end of the leg, whereby the leg is pivotable relative to the bracket 5 from an open position to a closed position. Spring means 11 urge the upper end 2 of the leg into engagement with the arm 16 of bracket 5. Catch means 14 are provided on the arm 16 and upper end 2 of the leg for locking the leg in the open position.

The catch means can be released by pressing the upper end 2 of the leg against the action of the spring means 11 whereupon the leg can be swung from the open position to the closed position.

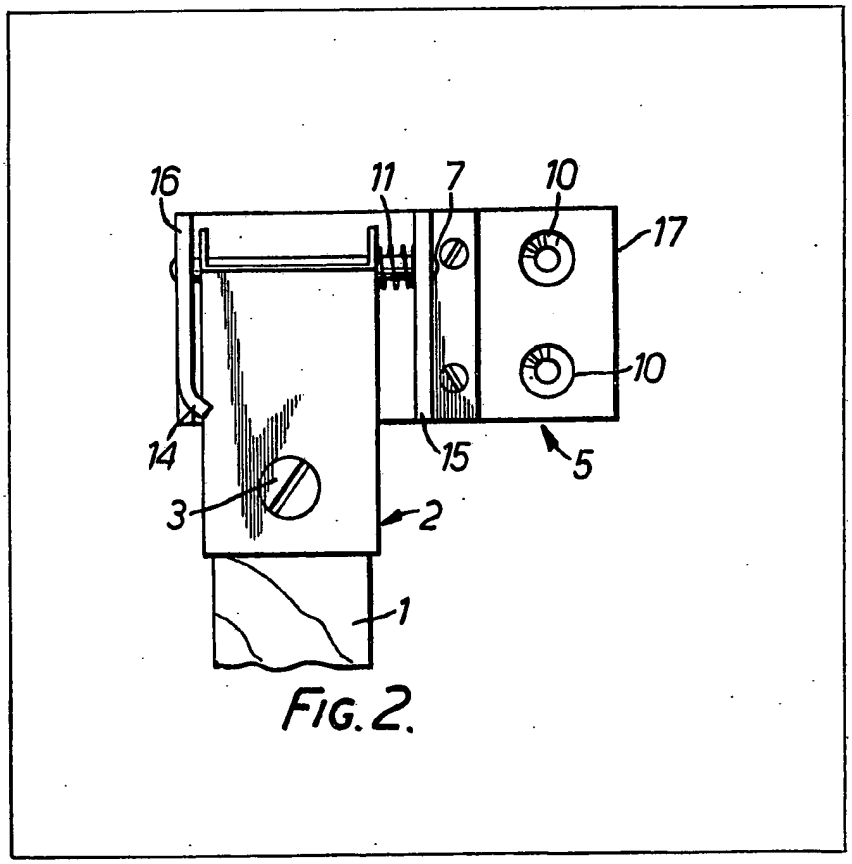

FIG. 2.

The drawings originally filed were informal and the print here reproduced is taken from a later filed formal copy.

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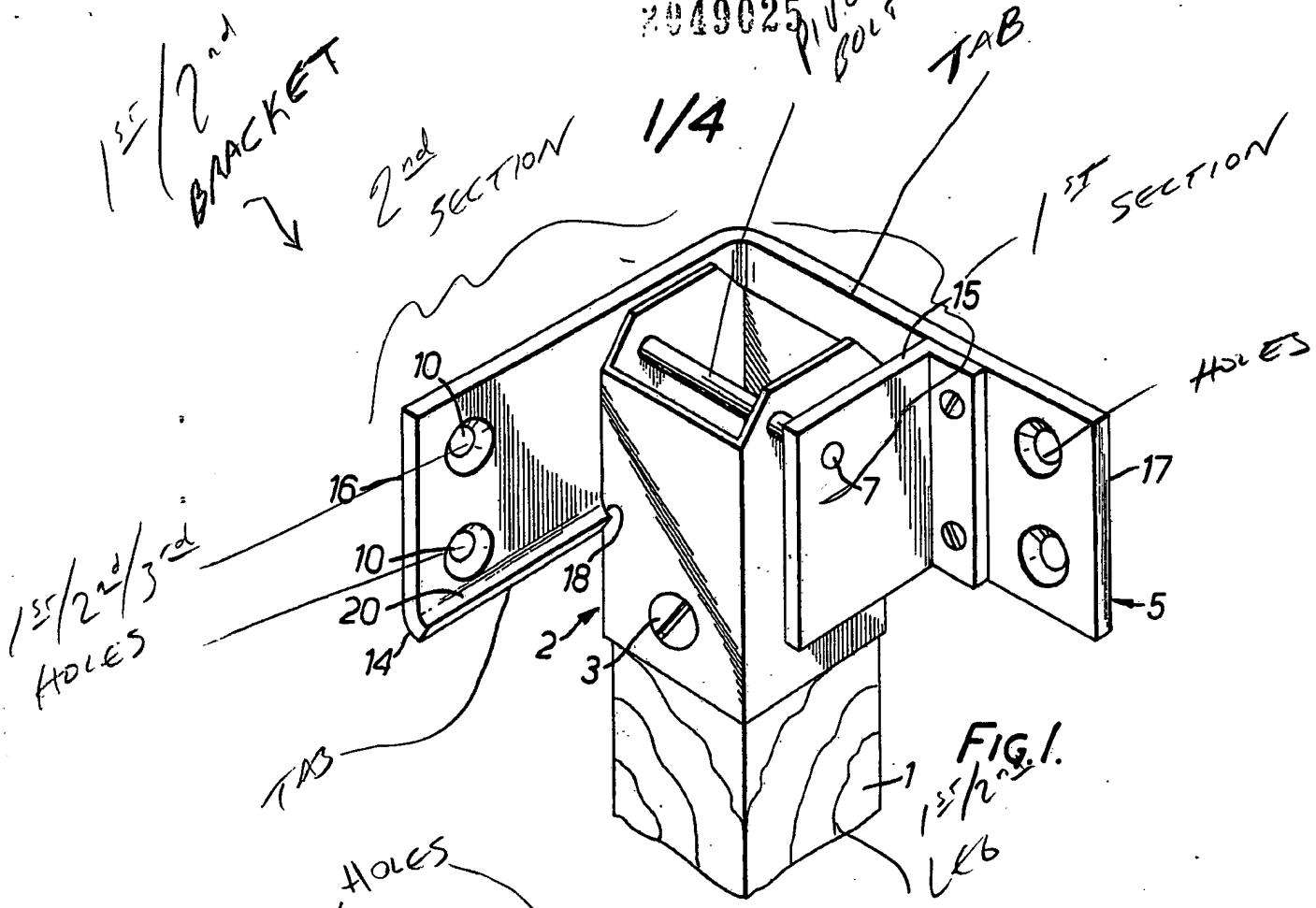

FIG. 1.

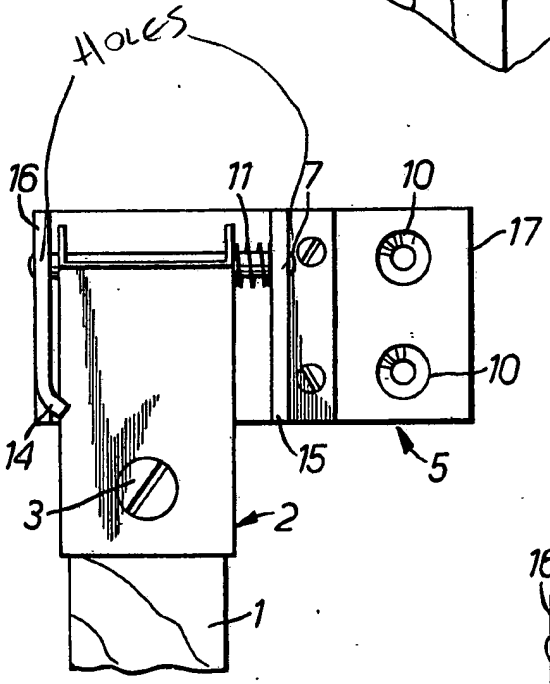

FIG. 2.

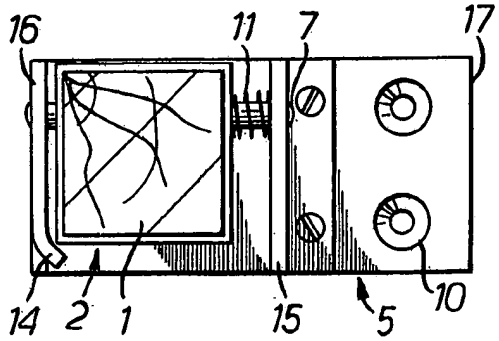

FIG. 3.

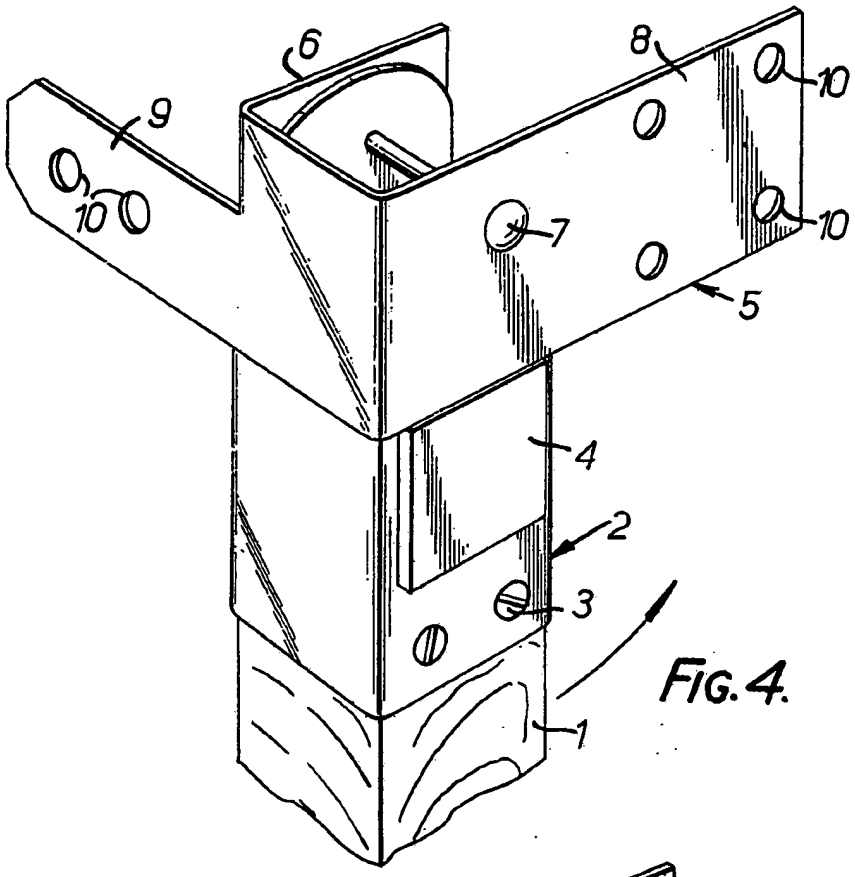

FIG. 4.

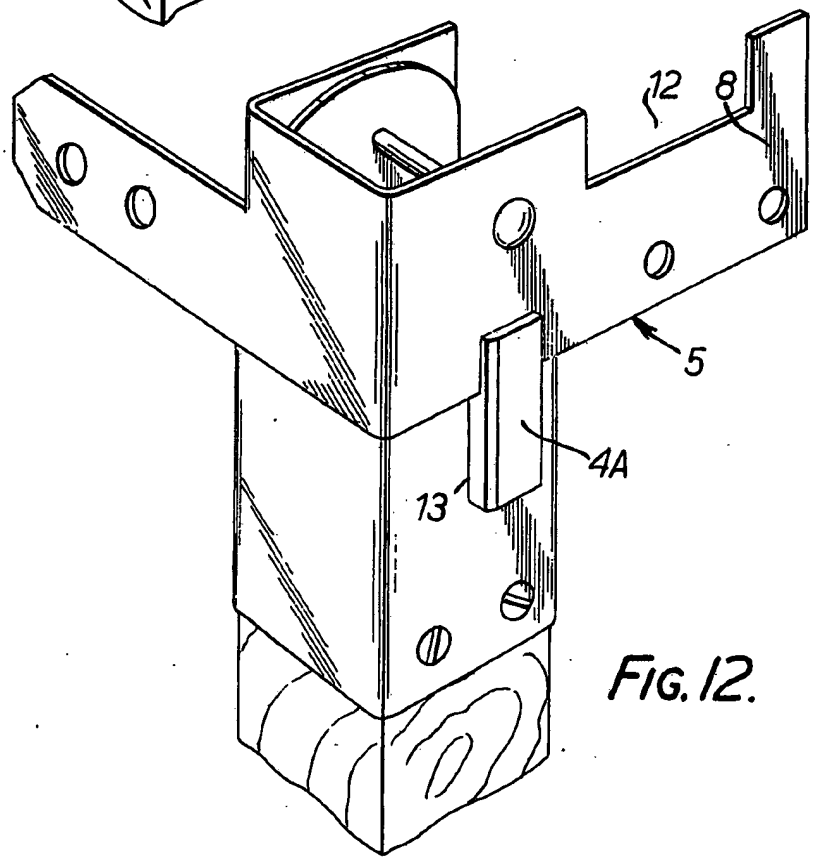

FIG. 12.

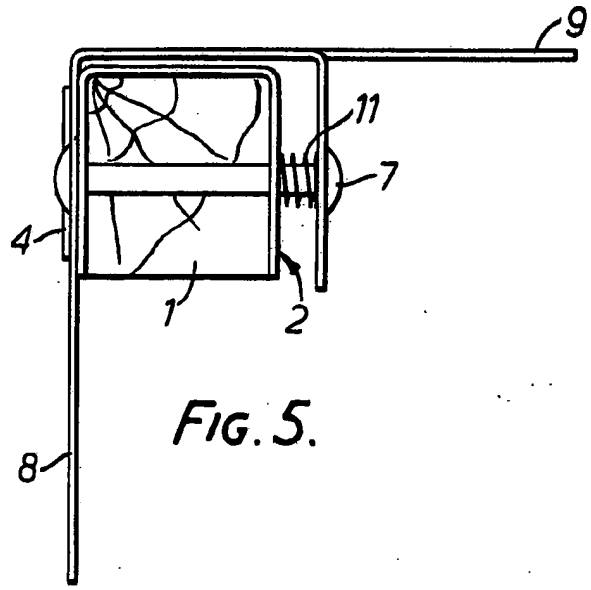

FIG. 5.

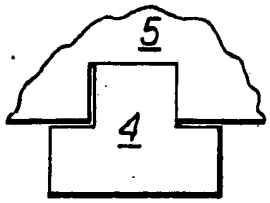

FIG. 7.

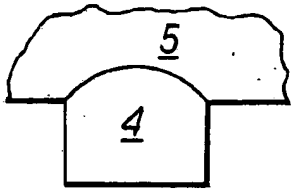

FIG. 8.

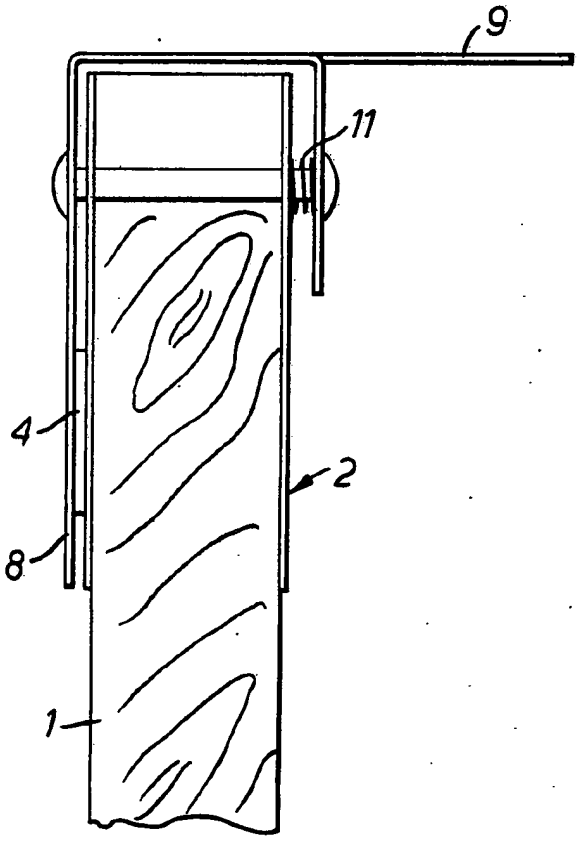

FIG. 6.

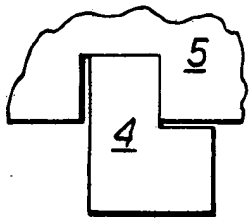

FIG. 9.

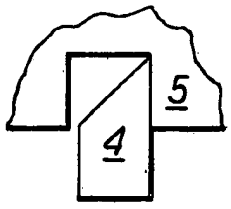

FIG. 10.

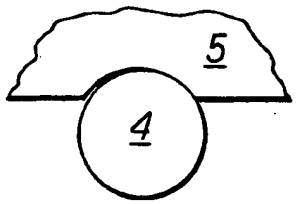

FIG. 11.

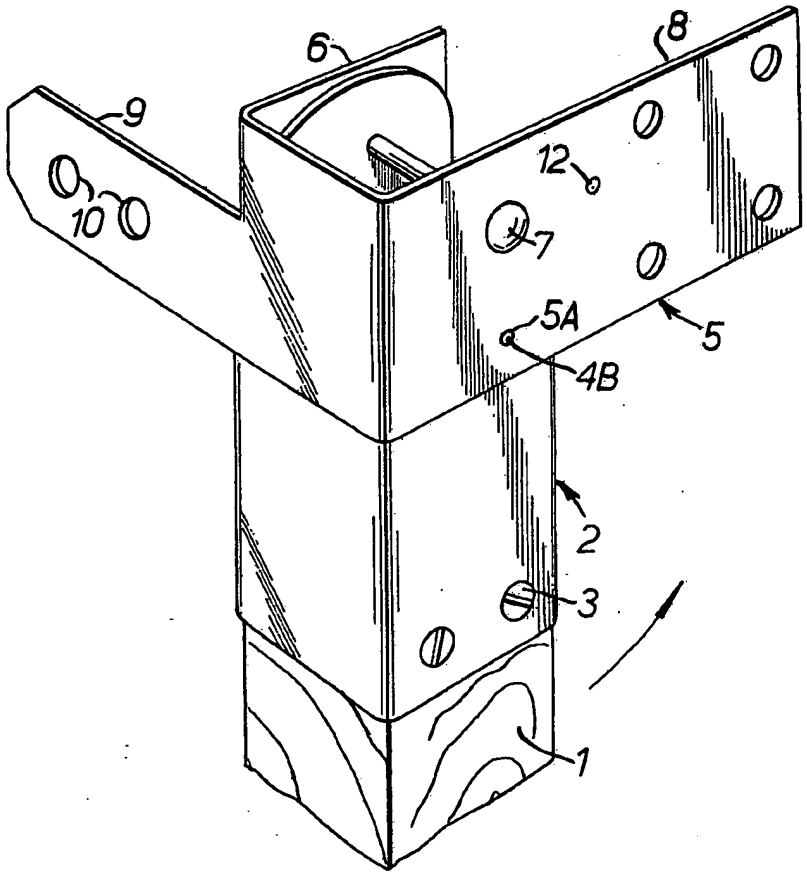

FIG. 13.

SPECIFICATION

Folding mechanism for legs, brackets and the like

This invention relates to a folding mechanism for legs, shelf brackets and the like and is particularly concerned with a mechanism for enabling the legs of a games table to be folded flat with the underside of the table top. It will be appreciated, however, that the mechanism may be applied to legs or other foldable parts of foldable furniture as well as to shelf brackets, which may be wall mounted, and to other articles.

Various mechanisms have been proposed for enabling the legs of games tables and the like to be folded flush or substantially flush with the table top. Most of these mechanisms involve stays or some form of releasable catch with finger-operated levers and many of these are in the form of fairly complex castings which are becoming increasingly expensive to manufacture. They may also form undesirable projections from the sides of the table.

It is an object of the present invention to provide a folding mechanism for legs or other supports to be folded which is simple and cheaper to manufacture than previously proposed mechanisms.

To this end, the present invention broadly provides a folding mechanism for a leg or other support to be folded comprising:

a first member which is said leg or other support or is adapted to carry said leg or other support;

a second member which is a bracket for securing the mechanism to the underside of a table top or to a wall or like surface against which the leg or other support is to be folded;

the second member having at least a substantially U-shaped portion embracing the upper or near end of said first member;

pivot means passing through the substantially U-shaped portion of the second member and the embraced end of the first member, whereby the first member is pivotable relative to the second from an open position to a closed position;

spring means associated with said pivot means and urging the first member into engagement with said second member; and

catch means provided on or integral with said first and second members for locking said first member in said open position;

the arrangement being such that when the first member is in the open position the catch means can be released by pressing the first member against the action of said spring means whereupon the first member can be swung from the open position to the closed position.

As a preferred feature of the invention, the catch means of the folding mechanism is adapted to lock the first member in the closed position.

As another preferred feature of the invention, the folding mechanism also comprises a locking device which operates in conjunction with the spring means to assist in locking the first member into an open or a closed position by preventing the compression of the spring means when the first member is pressed.

In order to enable the invention to be more readily understood, reference will now be made to the accompanying drawings, which illustrate diagrammatically and by way of example some embodiments thereof, and in which:

Figure 1 is a perspective view of a first main embodiment of a folding mechanism for a leg for a games table,

Figure 2 is an end elevational view of the mechanism shown in Figure 1,

Figure 3 is an end elevational view of the mechanism shown in Figure 1 but with the leg in a folded position,

Figure 4 is a view similar to Figure 1 of a second main embodiment of a folding mechanism,

Figure 5 is a plan view of the mechanism shown in Figure 4,

Figure 6 is a plan view of the mechanism shown in Figure 4 but with the leg in a folded position,

Figures 7 to 11 are diagrammatic views of different stop members and stop surfaces applicable to the embodiment of Figure 4,

Figure 12 is a view similar to Figure 4 of a modification of the folding mechanism shown in Figure 4, and

Figure 13 is a view similar to Figure 12 of a modification of the folding mechanism shown in Figure 4.

Referring now to Figures 1 to 13, there are shown folding mechanisms for a leg 1 for a games table. The games table (not shown) is in the form of an inverted tray with a flat top and a depending rim or wall at each of the four corners of which is mounted one of the folding mechanisms shown.

Figure 1 to 3 illustrate a first main embodiment of a folding mechanism in which a first member comprises a first bracket 2 which embraces all four sides of the upper end of the leg 1. The bracket 2 is secured to the leg 1 by countersunk wood screws 3. A second member is a second bracket 5, having arms 16 and 17 extending at right angles to one another. An inwardly directed plate 15 is secured to the arm 17 so as to define with the arm 16 and part of the arm 17, a substantially U-shaped portion. The arms 16 and 17 are formed with countersunk holes 10 to receive screws or the like so that the bracket 5 can be secured at the underside of the table with screws passing through the holes 10 into the depending rim or wall of the table top. The plate 15 is arranged in parallel and spaced relation to the arm 16 such that said U-shaped portion may embrace the upper end of the bracket 2, this bracket being pivotally attached to the bracket 5 by pivot means comprising a captive spindle 7 passing through the plate 15, a pair of opposing sides of the bracket 2, and the arm 16. The arm 16 is also formed with a flange 14 along its lower edge and near its free end, the flange acting as catch means holding the bracket 2 in either an open or a closed position, as shown in Figures 2

and 3 respectively.

As also shown in Figures 2 and 3, a coil spring 11 is mounted on the spindle 7 and urges the first bracket 2 into contact with the arm 16 of the second bracket 5.

Figures 1 and 2 show the leg 1 in the lowered or open position, in which position the leg is held rigid by engagement of the bracket 2, with the adjacent free end 18 of the flange 14 together with the simultaneous butting of the bracket 2 against the base of the U-shaped portion of the bracket 5.

In order to fold the leg into a closed position it is pressed at its top end towards the right in Figure 2, which will in effect be inwards of the table towards the opposite leg, and against the action of the coil spring, thus bringing the bracket 2 out of engagement with the end 18 of the flange 14, whereby the leg may be swung in the direction of the arrow in Figure 1 to the position shown in Figure 3. This disengagement can only be effected by pressure at the top end of the leg and accidental movement of the bottom end of the leg cannot cause disengagement along an axis at right angles to the leg at the top end against the spring.

Whilst the leg is being swung, the coil spring 11 is in a relatively compressed state, but when it reaches the raised or closed position in which it lies parallel to the lower edge of the bracket 5, the bracket 2 has cleared the flange 14 so that the bracket 2 is free to be urged into contact with the arm 16 by the relaxation of the coil spring 11, where the upper surface 20 of the flange 14 can retain the bracket 2 in the closed position as shown in Figure 3. The surface 20 of the flange 14 is angled so that the bracket 2 remains raised unless the leg is pressed inwards in which case the bracket 2 rides easily over the flange 14 into its lowered position.

Figures 4 to 6 illustrate a second main embodiment of a folding mechanism in which the first member comprises a first bracket 2 which is U-shaped in section and embraces three sides of the upper end of the leg 1. The bracket 2 is secured to the leg 1 by countersunk woodscrews 3. It will be noted that as the bracket is of simple U-shape when viewed in the axial direction of the leg 1 (c.f. Figure 5) and engages around three sides of the leg, no special woodworking operation to shape the leg to fit the bracket is required.

The second member is a second bracket 5 having a substantially U-shaped portion 6 which embraces the upper part of the first bracket 2 and is pivotally secured to the bracket by pivot means comprising a captive spindle 7 passing through the arms of the portion 6 and the upper ends of the arms of the bracket 2. The U-shaped portion of the bracket 5 has an extension 8 of one arm and an extension 9 of its base, the extensions 8 and 9 being formed with countersunk holes 10 to receive screws or the like so that the bracket 5 can be secured at the underside of the table with screws passing through the holes 10 into the depending rim or wall of the table top.

One arm of the bracket 2 has a stop plate 4 welded to it, and, when the mechanism is in the unfolded condition shown in Figure 4, the stop plate 4 is engaged by a stop surface being the lower edge of a second bracket 5, stop plate 4 and stop surface of bracket 5 together constituting catch means.

As shown in Figures 5 and 6, a coil spring 11 is mounted on the captive spindle 7 and urges the first bracket 2 in such manner as to cause the arm having the stop plate 4 to engage directly or via the stop plate 4 against the adjacent arm of the second bracket 5.

Figures 4 and 5 show the leg 1 in the open or unfolded position and the leg is locked in the open position and held rigid by engagement of the stop plate 4 against the stop surface of the bracket 5. This engagement can be made to coincide with the butting of the bracket 2 against the base of the U-shaped portion of the bracket 5 for greater strength and stability. In order to fold the leg, it is pressed at its top end towards the right in Figure 5, which will in effect be inwards of the table towards the opposite leg, and against the action of the coil spring, thus bringing the stop plate out of engagement with the stop surface on the bracket 5, whereby the leg may be swung in the direction of the arrow in Figure 4 to the position shown in Figure 6. Disengagement of the stop plate and stop surface can only be effected by pressure at the top end of the leg and accidental movement of the bottom end of the leg cannot cause disengagement along an axis at right angles to the leg at the top end against the spring.

It will be appreciated that many modifications of this second main embodiment of the folding mechanism are possible. The shape of the bracket 5 may be varied according to the location in which it is to be fitted. Figures 7 to 11 show various forms which the stop plate 4 and stop surface on the bracket 5 may take in order to provide the required locking of the leg in the open position.

It will be seen from Figure 6, that when the leg is in the folded position, the coil spring 11 is in a compressed condition. In order to relieve the coil spring when the leg is unfolded and to lock the leg in the folded position it is preferred to include a supplementary stop surface in the form of a recess in the bracket 5 to receive the stop plate and such an arrangement is shown in Figure 12. In this modification the extension 8 of the bracket 5 is formed with a complementary recess 12 for the stop plate 4A, the edge of which plate is bevelled at 13 so that the leg normally stays closed, but so that the stop plate can be released from the recess and ride over the extension 8 when the leg is pressed inwards to release it from the folded condition.

Figure 13 illustrates a variation of the mechanism of Figure 12, in which the stop plate 4A is replaced by a pin 4B, and the stop surface and the supplementary stop surface are defined by respective receiving holes 5A and 12A formed in bracket 5.

As an additional stabilizing feature, applicable to any of the above mentioned embodiments and

variations thereof, enabling the leg 1 to be locked in an unfolded position, the mechanism may be additionally provided with a locking device. The arm of the U-shaped portion which projects inwardly of bracket 5, may be provided with a thumb screw which may be screwed into engagement with the adjacent face of the bracket 2 to achieve locking. Alternatively, a locking block may be pivotally attached to the captive spindle 7 between said arm and the bracket 2, swingable into a locking position between said arm and said bracket.

Apart from the U-shaped portion and any catch means provided on bracket 5, it will be appreciated that the shape of the bracket 5 and any extensions is determined by the location in which it is to be fitted.

The present folding mechanism is simple and cheap to manufacture since the two brackets may be cold worked metal stampings. The shape of the bracket 5 as described with reference to the drawings is such that, with the table described, it reinforces the corners of the depending rim or wall of the table so that the rim or wall can be formed with simple butting corners rather than mitred or dovetailed corners, thereby reducing the expense of making the table.

Apart from its use for folding legs for games and other tables, the present folding mechanism can be adapted for trestle tables, where the legs are angled relative to the table top, by appropriate shaping and/or orientation of the catch means. Furthermore, the mechanism can be used for shelf brackets or other folding articles.

The table top and legs are normally made of wood, but it will be appreciated that the mechanism can be a fitting for, or an integral part of, a metal construction.

CLAIMS

1. A folding mechanism for a leg or other support to be folded comprising:

a first member which is said leg or other support or is adapted to carry said leg or other support;

a second member which is a bracket for securing the mechanism to the underside of a table top or to a wall or like surface against which the leg or other support is to be folded,

the second member having at least a substantially U-shaped portion embracing the upper or near end of said first member;

pivot means passing through the substantially U-shaped portion of the second member and the embraced end of the first member, whereby the first member is pivotable relative to the second from an open position to a closed position;

spring means associated with said pivot means and urging the first member into engagement with said second member; and

catch means provided on or integral with said first and second members for locking said first member in said open position;

the arrangement being such that when the first member is in the open position the catch means can be released by pressing the first member against the action of said spring means whereupon the first member can be swung from the open position to the closed position.

2. A folding mechanism as claimed in claim 1, wherein the catch means is adapted to lock the first member in the closed position.

3. A folding mechanism as claimed in claim 2, wherein the catch means is formed along the lower edge of that face of the second member which is urged into engagement with the first member and projects inwardly of such face for retaining the first member in the closed position, and wherein the catch means is disposed such that when the first member is in the open position, the first member is constrained against movement by engagement between the catch means and the base of the U-shaped portion of the second member.

4. A folding mechanism as claimed in claim 3, wherein the catch means is provided by a flange formed along the lower edge of the engaging face of the second member and projecting inwardly of said face toward the first member.

5. A folding mechanism as claimed in claim 1 or 2, wherein the catch means comprises a stop member on one of said members which stop member projects from said one member in a direction toward the engaging face of the other said member, and a stop surface on said other member having a shape complementary to said stop member for engagement therewith when the first member is in the open position.

6. A folding mechanism as claimed in claim 5, wherein the catch means also comprises a supplementary stop surface on said other member having a shape complementary to the stop member for engagement therewith when the first member is in the closed position.

7. A folding mechanism as claimed in claim 5 or claim 6, wherein the stop member is provided on or integral with the first member and the stop surface is provided on or integral with the second member.

8. A folding mechanism as claimed in any preceding claim, wherein the mechanism also comprises a locking device which operates in conjunction with the spring means to assist in locking the first member into an open or a closed position by preventing the spring means from being compressed.

9. A folding mechanism as claimed in claim 8, wherein the locking device comprises a thumbscrew, which is located on the arm of the U-shaped portion of the second member furthest from the first member, and which may be screwed into engagement with the adjacent face of the first member to achieve locking.

10. A folding mechanism as claimed in claim 8, wherein the locking device comprises a locking block which is pivotally attached to the pivot means between the first member and the arm of the U-shaped portion of the second member furthest from the first member, and which is swingable into a locking position between said

arm and the first member.

11. A folding mechanism as claimed in any preceding claim, wherein the pivot means comprises a captive spindle.

12. A folding mechanism as claimed in any preceding claim, wherein the spring means comprises a coil spring.

13. A folding mechanism as claimed in any preceding claim, wherein the first member comprises a bracket having a U-shaped cross-section and adapted to embrace three sides of a leg or other support of rectangular cross section.

14. A folding mechanism for a leg or other support to be folded, substantially as herein described with reference to and as shown in Figures 1 to 3, Figures 4 to 6 and in any one of Figures 7 to 13 of the accompanying drawings.

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